3.3 WATER RESOURCES

Significance Criteria

The significance of potential impacts to the watershed is determined in part through compliance with the Clean Water Act (33 USC 1344), as regulated by the U.S. Army Corps of Engineers (USACE) and the USEPA. A delineation of Waters of the United States on the DGP site was completed and subsequently approved by USACE, and is included as **Appendix H**. The jurisdictional determination made by USACE is included as **Appendix Q**. The Kilbourn Road Ditch, on the west side of the DGP site, has been identified as the only jurisdictional wetland on the project site. For wastewater disposal, significance is also measured by compliance with effluent standards set forth in the Clean Water Act, or in the case of the DGP, by compliance with the standards of the City of Kenosha, since the wastewater would be discharged to the City sewer system.

Significance criteria for impacts to floodplains is guided by Executive Order 11988, which addresses floodplain management. The order requires the evaluation of actions taken in a floodplain. Specifically, the order states that Federal agencies shall first determine whether the proposed action will occur in a floodplain. Second, if an agency proposes to allow an action to be located in a floodplain, "the agency shall consider alternatives to avoid adverse effects and incompatible development in the floodplains." Finally, if the only practicable alternative action requires siting in a floodplain, the agency shall "minimize potential harm to or within the floodplain."

In 1972, Congress passed the Federal Clean Water Act, which sets forth national goals for the quality of surface waters, which applies to both point and non-point sources of pollution (Sections 402 and 319 respectively). Significance criteria for determining impacts to surface water quality are determined according to exceedance of the standards set forth in the Clean Water Act. The goals expounded in the Clean Water Act include maintaining waters safe for fishing and swimming, eliminating harmful discharges of pollution, and the protection of the nation's wetlands. The Clean Water Act also requires states to establish designated uses and set water quality standards for all contaminants in surface waters and to review and update them on a triennial basis (Section 303(c)). The Wisconsin Department of Natural Resources (WDNR) implements the Clean Water Act in Wisconsin under the delegation and oversight of the USEPA. WDNR and USEPA have jurisdiction by law under 40 CFR 1508.15.

The WDNR has established designated uses for the Des Plaines River Watershed to govern water management decisions and to preserve and enhance the quality of waters. Administrative Code Chapter NR 102 of the Wisconsin Statutes states that water quality standards necessary to support designated uses "shall protect the public interest, which includes the protection of public health and welfare and the present and prospective uses of all waters of the state for public and private

water supplies, propagation of fish and other aquatic life and wild and domestic animals, domestic and recreational purposes, and agricultural, commercial, industrial, and other legitimate uses" (NR 102.01). The designated uses established for the Kilbourn Road Ditch by the WDNR include warm water sport fish communities and full recreational use. These designated uses are defined as follows:

- Warm water sport fish communities – Subcategory of fish and other aquatic life uses, which includes surface waters capable of supporting a community of warm water sport fish or serving as a spawning area for warm water sport fish.
- Recreational uses – Includes all uses of water for recreational activities involving proximity to water and body contact with water, where ingestion of water is reasonably possible.

The WDNR has also provided water quality standards to protect designated uses, as defined in Administrative Code Chapter NR 102 of the Wisconsin Statutes. The Des Plaines Watershed defines the water quality standards as "statements of the physical, chemical, and biological characteristics of the water that must be maintained if the water is to be suitable for the specified uses" (Southeastern Wisconsin Regional Planning Commission, 2004). All surface waters must meet minimum standards at all times and under all flow conditions in addition to standards specific to designated uses for that water body. While the WDNR has no approval authority over the Proposed Project, the goals and policies relating to the Des Plaines River and its tributaries contained within the Southeast Fox River (Integrated Basin Plan) are summarized to characterize the water quality issues in the project area. The water quality standards for Wisconsin surface waters are defined in Chapter NR 102 of the Wisconsin Administrative Code and are summarized in **Table 3.3-1**.

Section 303(d) of the Clean Water Act additionally requires states to prepare periodically a list of all surface waters in the state for which designated uses of the water are impaired by pollutants. These are estuaries, lakes, streams, and groundwater basins that fall short of state surface water quality standards, and are not expected to improve within the next two years. States are also required to establish a priority ranking of these impaired waters for purposes of developing plans that include Total Maximum Daily Loads (TMDLs). These plans describe how an impaired water body will meet water quality standards through the use of TMDLs. A TMDL is a calculation of the maximum amount of a pollutant that a water body can receive and still meet water quality standards, and an allocation of that amount to the pollutant's sources. Neither the Des Plaines River nor the Kilbourn Road Ditch—the only jurisdictional "Water of the U.S." on the property—is on the impaired waters list.

As a result of the 1987 Clean Water Act amendments, the USEPA established the National Pollutant Discharge Elimination System (NPDES) pursuant to the Clean Water Act (33 USC §§

TABLE 3.3-1
WATER QUALITY STANDARDS FOR THE KILBOURN ROAD DITCH

Constituent	Water Quality Standard
Minimum Standards	
Settleable Material	Substances that will cause objectionable deposits on the shore or in the bed of a body of water, shall not be present in such amounts as to interfere with public rights in waters of the State.
Floating Material	Floating or submerged debris, oil, scum or other material shall not be present in such amounts as to interfere with public rights in waters of the state.
Color and Odor	Materials producing color, odor, taste, or unsightliness shall not be present in amounts found to be of public health significance, nor shall substances be present in amounts that are acutely harmful to animal, plant, or aquatic life.
Toxic Material	Substances in concentrations or combinations which are toxic or harmful to humans shall not be present in amounts found to be of public health significance, nor shall substances be present in amounts which are acutely harmful to animal, plant or aquatic life.
Aquatic Life Standards	
Dissolved Oxygen	(1) The dissolved oxygen content in surface waters may not be lowered to less than 5 mg/L at any time.
Temperature	(1) There shall be no temperature changes that may adversely affect aquatic life. (2) The maximum temperature rise at the edge of the mixing zone above the existing natural temperature shall not exceed 5°F for streams and 3°F for lakes. (3) Natural and daily seasonal temperature fluctuations shall be maintained. (4) The temperature shall not exceed 89°F for warm water fish.
pH	The pH shall be within the range of 6.0 to 9.0, with no change greater than 0.5 units outside the estimated natural seasonal maximum and minimum.
Un-ionized Ammonia Nitrogen (mg/l)	The concentration of un-ionized ammonia nitrogen shall not exceed 0.04 mg/l to minimize the zone of toxicity and to reduce dissolved oxygen depletion caused by oxidation of the ammonia.
Chloride (mg/l)	The concentration of chloride shall not exceed 1,000 mg/l, which represents the threshold concentration for the propagation of freshwater fish, above which the effects on aquatic life may become significant.
Recreational Use Standards	
Bacteria	In surface waters designated for recreational uses, the membrane filter fecal coliform count may not exceed 200 per 100 ml as a geometric mean based on not less than 5 samples per month, nor exceed 400 per 100 ml in more than 10 percent of all samples during any month.
Total Phosphorus (mg/l)	In streams classified for full recreational use, the total phosphorus concentration shall not exceed 0.1 mg/l.

SOURCE: WDNR, 2004; Southeastern Wisconsin Regional Planning Commission, 2004

1251 to 1387). NPDES is a national program for regulating and administering permits for discharges to receiving waters. The USEPA is ultimately charged with regulating discharges to

surface waters. In some states, the USEPA has delegated permitting authority to the state water quality management programs; however, the USEPA continues to regulate discharges originating on Tribal lands into receiving waters. Under the Federal Clean Water Act, the sovereignty of Indian Tribes is recognized as such that they can be treated similarly to states, implying the use of Tribal Government Regulations for the purpose of NPDES program [33 USC § 1377(e)].

Stormwater pollution regulations at the Dairyland Greyhound Park are currently enforced by the City of Kenosha and the WDNR. The City of Kenosha Storm Water Management Criteria is based on Chapter NR 151.12 of the Wisconsin Administrative Code, which requires a stormwater management plan and permit for the control of polluted storm runoff for new development, redevelopment, or in-fill development of one acre or more. Where the City's criteria differ from NR 151.12, the more restrictive standard is used. City discharge requirements include an 80 percent reduction of total suspended solids for new development and in-fill development and a 40 percent reduction of total suspended solids for redevelopment (City of Kenosha, 2003).

For stormwater volume, the project would be considered to have a significant impact if it were to cause an exceedance of the hydraulic capacity of the downstream storm drainage system.

At the Keshena site, impacts to groundwater would be significant if withdrawals from the aquifer for the casino expansion cause an exceedance of the safe yield of the aquifer.

3.3.1 SURFACE WATER, DRAINAGE, AND FLOODING

KENOSHA PROJECT SITE

Precipitation in the Kenosha region takes the form of rain, sleet, hail, and snow. Average annual precipitation for the Kenosha area is approximately 32.61 inches per year, with a maximum 24-hour rainfall of 6.84 inches and a maximum 24-hour snowfall of 30 inches. Annual evaporation from water surfaces within the Kenosha region approximates 29 inches, roughly equal to the average annual precipitation of 32.61 inches. The average annual evapotranspiration is about 22 inches.

Watershed

The DGP site is located within the major basin of the Mississippi River and the regional Southeast Fox River Basin (Wisconsin Department of Natural Resources, 2002). Surface runoff from over 1,000 square miles within the Southeast Fox River Basin watershed flows to the Des Plaines River and ultimately into the Mississippi River. Locally, the project area is within the Des Plaines River Watershed (WDNR Watershed Code FX01), which encompasses approximately 133 square miles (**Figure 3.3-1**). The watershed drains by approximately 70 miles of perennial streams, including the Des Plaines River and its tributaries: Jerome Creek, the Kilbourn Road Ditch, Center Creek, Brighton Creek, and the Dutch Gap Canal.

INSERT FIGURE 3.3-1: Regional Watershed

Kilbourn Road Ditch and its fringing wetland floodplain forest, a naturally occurring pond, and four constructed ponds exist within the study area, occupying a total of approximately 36 acres. No surface water features or jurisdictional wetlands exist within the construction footprint of the Proposed Project.

The Kilbourn Road Ditch, a narrow perennial stream, occurs approximately one-half mile west of the proposed gaming facility. The Kilbourn Road Ditch turns into Kilbourn Creek, which empties into the Des Plaines River approximately two miles south of the site where the river continues flowing south to its confluence with the Kankakee River at Channahon where the two form the Illinois River, and thence the Mississippi River, which is a navigable waterway.

Drainage

Stormwater management for approximately 78 acres of impervious surfaces on the existing site is primarily accomplished by storm sewers, culverts and ditches that discharge to a detention basin located on the southeast corner of the property. This south detention basin receives water from an existing pond on the northern boundary of the site via storm sewers. The pond on the northern boundary also receives runoff from across State Hwy 158. The south detention basin discharges to a storm sewer that goes south beneath 60th Street (County Trunk Highway "K") approximately 600 feet, and discharges to a ditch. The ditch drains to the storm sewer and ditch system of an existing development south of CTH "K" that includes swales, storm sewer, and detention basins, eventually discharging to the Kilbourn Road Ditch approximately 1,200 feet north of 75th Street.

The City and the WDNR regulate stormwater management on the existing site. The stormwater management system for the existing site was designed in accordance with local requirements in effect at the time of construction. Stormwater regulations have since changed in the City and include more restrictive standards regarding stormwater management criteria (Mike Lemmons, personal communication); as a result, the performance of the existing system is currently below standards. Graef, Anhalt, Schloemer, and Associates Inc., investigated existing drainage and storm sewer systems on the Dairyland Greyhound Park site (**Appendix C**).

The existing site is served by a network of storm sewers, ranging in size from 12-inch diameter to 54-inch diameter. Four major storm sewer systems exist, all of which convey runoff from north to south, discharging to the detention basin on the south side of the site. The storm sewers serve the parking lots, the clubhouse building, the track, and the kennel area. Several locations within the parking lot are drained by special inlet structures, comprised of trench drains with lengths from 8 to 20 feet. Other portions of the parking area are served by standard catch basins and grated manholes. An underdrain system also exists within the kennel area to drain the turf areas. It is comprised of a 40-inch diameter perforated polyethylene pipe in a crushed stone bedding, and is connected to the storm sewer system. A storm sewer connects the north wetland/detention area to the south detention basin.

The storm sewer system has a combined discharge capacity to the south retention basin of 289 cubic feet per second (cfs), under open channel conditions, and substantially more under surcharged conditions. The two largest outfalls, 54-inch diameter each, have a maximum open channel capacity of 128 cfs and 108 cfs. Stormwater management calculations show peak runoff from the storm sewer area of 158 cfs for a 5-year storm and 253 cfs for a 10-year storm. This suggests that the existing storm sewer system is capable of handling runoff from a 10-year storm. Excess runoff under conditions that would exceed the capacity of the storm sewer system would pond within the system until capacity was available, or flow overland to the detention basin. The storm sewer system is classified as excellent, due to the available capacity and condition of the system.

Floodplain

The Kilbourn Road Ditch passes through the western edge of the site. The City of Kenosha Flood Insurance Rate Map (FIRM) panel number 5502090006C shows the regulatory 100-year floodplain boundary and relative floodplain elevations within the property shown on **Figure 3.3-2**. The extent of the floodplain was determined from Federal Emergency Management Agency (FEMA) maps compiled for the City of Kenosha and unincorporated areas within Kenosha County (2/17/82, revised 12/5/96). **Figure 3.3-2** shows the location of the modified 100-year floodplain boundary on the proposed condition site plan, based on the elevations shown on the FIRM. The proposed gaming facility and other proposed developments do not lie within the floodplain of this watercourse.

Since the passage of the National Flood Insurance Reform Act of 1994, Federal policy has placed increased emphasis on the application of nonstructural approaches to floodland management. One key nonstructural measure that is well suited to the Proposed Project is the floodland regulation that controls the manner in which new urban development is carried out so as to assure that activities in the floodway and flood fringe do not aggravate upstream and downstream flood problems. This may be accomplished through zoning, land subdivision control, sanitary, and building ordinances. The preliminary grading and stormwater management plan prepared by GASAI (2004) shows that the proposed grading for the Proposed Project will not impact the floodplain (**Appendix C**).

KESHENA SITE

Precipitation in the Keshena region takes the form of rain, sleet, hail, and snow. Average annual precipitation for the Keshena area is approximately 30 inches per year, with a 25-year, 24-hour precipitation maximum of 5.29 inches (Huff and Angel, 1992).

Figure 3.3-2 Kilbourn Road Ditch Floodplain Map

Watershed

Regionally, the Menominee Reservation is part of the Lake Michigan surface-water drainage basin. The intermediate river basins in the vicinity include the Fox-Wolf and the Menominee-Oconto-Peshtigo river basins. Within these basins, the Wolf and the South Branch of the Oconto, are the two primary local surface-water drainage basins in the Reservation. Locally, the Menominee Casino lies within the Wolf River Basin and the West Branch Wolf River Watershed (WDNR Watershed Code Wr17-112). **Figure 3.3-3** shows the Wolf River Basin in the Keshena region.

The Wolf River flows south through the Menominee Indian Reservation. The Reservation is drained by the Wolf River and its tributaries apart from the eastern quarter of the Reservation, which is drained by the South Branch of the Oconto River. The average discharge of the Wolf River, monitored continuously during 1907 to 1985 at Keshena Falls near Keshena, was 762 cfs, with a maximum instantaneous discharge of 5,200 cfs rerecorded in 1973 (USGS, 1994). Tribal ordinances have been established to protect the integrity of the Reservation waters. Additionally, the Wolf River is a Congressionally designated Wild and Scenic River from the northern boundary of the Reservation to Keshena Falls.

Drainage at the Menominee Casino is currently achieved through a system of underground concrete pipes owned and operated by the Tribe. Drainage flows from south to north into a main 27-inch pipe south of the restaurant, a 24-inch pipe along the perimeter of the new building wing, a 15-inch pipe along the western edge of the hotel, and an open ditch along the eastern frontage road of the property. Stormwater runoff flows offsite in an underground system to a low-lying field southeast of the casino property, eventually discharging into the Wolf River. No retention basins currently exist on the Menominee Casino.

Floodplain

The City of Keshena is located within an unmapped floodplain zone (FEMA unmapped_555643) and is not considered a high priority area for mapping (WDNR, 2004). However, the Tribal Environmental Service Department in Keshena performed a floodplain delineation of the Wolf River for 50-year and 100-year floodplain boundaries. According to this floodplain map, the Menominee Casino is not located within the 50-year or the 100-year floodplain. **Figure 3.3-4** shows the floodplain boundary in relation to the existing Menominee Casino facilities. Proposed expansion to the casino will not be constructed within the 100-year floodplain waterway.

3.3.2 GROUNDWATER

KENOSHA PROJECT SITE

The groundwater resources of the Des Plaines River watershed constitute the major sources of supply for domestic, municipal, and industrial water users in the area. Groundwater in the region of the project site flows through a complex system of various layers and ages of rock formations.

Figure 3.3-3: Wolf River Watershed Map

Figure 3.3-4: Wolf River Floodplain Map

Lithologic materials anticipated to underlie the project site are crystalline rocks of the Precambrian era, Cambrian through Silurian sedimentary rocks of the Paleozoic era, and unconsolidated surficial deposits. Only the glacial deposits consisting of unconsolidated sand, silt, clay, gravel, and boulders are exposed in the Des Plaines River watershed; no known bedrock outcrops exist in the basin. Unconsolidated surficial deposits within the watershed have a thickness of 0 to 340 feet and the underlying dolomite, shale, and sandstone bedrock layers reach a combined thickness in excess of 1,500 feet. **Table 3.3-2** summarizes the stratigraphy of the Des Plaines River watershed.

TABLE 3.3-2
STRATIGRAPHY OF THE DES PLAINES RIVER WATERSHED

System	Geologic Unit	Thickness Range (feet)	Dominant Lithology	Hydrologic Unit[a]	Water-Yielding Characteristics
Quaternary	Pleistocene and Holocene	0-340	Clay, silt, sand, gravel, and boulders; possibly locally stratified	Sand and gravel aquifers	Small to moderate yields can be obtained from large sand and gravel aquifers
Silurian	Dolomite, undifferentiated	0-345	Dolomite	Niagra aquifer	Very small to large yields, depending upon the size and number of crevices
Ordovician	Maquoketa shale	180-250	Shale	Aquiclude	Small yields
	Platteville, Decorah, and Galena Formations, undifferentiated	250-345	Dolomite	--	Small yields from crevices
	St. Peter sandstone	100-200	Sandstone	--	Moderate yields
	Prairie du Chien Group	0-60	Dolomite	--	Small yields
Cambrian	Trempealeau Formation	0-120	Dolomite	Sandstone aquifer	Small yields
	Franconia and Galesville sandstone, undifferentiated	60-150	Sandstone	Sandstone aquifer	Moderate to large yields from well-sorted sandstone near the base
	Eau Claire sandstone	340-405	Sandstone	--	--
	Mount Simon sandstone	637-1,500+	Sandstone	Sandstone aquifer	Moderate to large yields
Precambrian Rocks	Unknown	Unknown	Crystalline rocks	--	Not water-bearing

NOTE: [a]The combination of the unconfined sand and gravel and dolomite aquifers is sometimes referred to as the "shallow aquifer" and the confined sandstone aquifer is sometimes referred to as the "deep aquifer."
SOURCE: U.S. Geological Survey and SWERPC, 2002

The project site is located within the Silurian dolomite aquifer, which is present only in eastern Wisconsin. The Silurian dolomite aquifer is the uppermost bedrock aquifer in most of the Southeastern Wisconsin Region, often hydraulically connected to the sand and gravel aquifer. Wells tapping this aquifer generally yield from 10 to 100 gallons per minute (gpm) and are commonly between 100 and 400 feet deep. Currently, onsite groundwater resources are not utilized at the Dairyland Greyhound Park.

The native soils encountered at the site during a preliminary subsurface exploration and geotechnical evaluation consisted predominantly of silty clay (Wagner Komurka Geotechnical Group, Inc., 2004) (**Appendix D**). A few silt and/or fine sand seams were also encountered. The consistency of the silty clay ranged from stiff to hard, with decreasing consistencies with depth. Water contents ranged from 12 to 22 percent. Groundwater was encountered at depths ranging from 1.7 feet to a dry borehole (i.e., no water encountered to a depth of 25 feet). Due to the predominantly low permeability at the site, these observations are likely to reflect the existence of water-bearing granular seams, which may possibly be perched, and not necessarily indicative of the groundwater table. Variations in the groundwater elevation should be expected.

KESHENA SITE

Groundwater is the source of all domestic water used on the Menominee Reservation. The Menominee Tribal Utility Department (MTUD) currently provides water to the Menominee Casino. MTUD operates two groundwater wells in downtown Keshena which serve as the water supply for the existing casino-hotel facilities.

The Reservation is underlain by bedrock that is buried beneath loamy and sandy gravelly surficial deposits (USGS, 1995). The area stratigraphy consists of basal Precambrian crystalline bedrock and overlying till and sand and gravel deposits, ranging in thickness from zero to 180 feet (USGS, 1994). Glacial depression and then postglacial uplift caused the top layers of granite to fracture from the stress of movement, creating the bedrock aquifer. The bedrock aquifer is composed of fractured and weathered Precambrian bedrock within about 20 feet of the upper bedrock surface. Although USGS has defined the top 20 feet of the granite as a bedrock aquifer, this zone is actually an aquiclude, which means the rock does not allow water to move some distance to a lower level or laterally (Menominee Tribe, 2004). Water accumulates in the fractured surfaces; however, the fractures are not well connected, and lateral water movement is usually minimal and unpredictable.

Glacial advances and retreats created the glacial till and outwash aquifer on the Reservation. The till and outwash aquifer is composed of saturated, permeable sand and gravel that occurs as layers, lenses, terrace deposits, and valley fillings. Horizontal hydraulic conductivity of the sand and gravel and bedrock aquifers is estimated to be 5 and 0.3 feet per day, respectively (USGS, 1994).

Water-table conditions exist generally in both aquifers. Below land surface, at depths averaging 10 to 15 feet, groundwater fills and travels through interconnected pore spaces of the till and outwash aquifer and in fractures in the weathered bedrock aquifer. The till and outwash aquifer generally yields more water than the bedrock aquifer (Menominee Tribe, 2004). Adequate well yields are dependant on the saturated thickness and other aquifer characteristics.

The water table is at or near the surface in the vicinity of some lakes and wetlands. In other parts of the Reservation, depth to the water table can be as great as 80 feet. Generally, groundwater flows from topographic high areas to topographic low areas, where it discharges to streams, lakes, and wetlands.

3.3.3 WATER QUALITY

KENOSHA PROJECT SITE

Surface Water Quality

The majority of assessed rivers in Wisconsin support aquatic organisms that are susceptible to point and non-point pollutants. Stormwater discharges from residential and industrial areas are of particular concern when managing surface water quality. The primary causes of contamination include habitat alterations, excessive siltation and sedimentation, and nutrient enrichment (USEPA, 2000). Non-point sources affecting the rivers include agriculture and grazing, hydrologic modification, and habitat degradation.

Most non-point sources of pollution to surface waters can be designated as either rural or urban in origin. Eroding streambanks and construction site erosion are found in both urban and rural areas. Rural non-point sources are often, but not always, associated with agricultural operations. The major non-point pollutants in rural areas are nitrogen, phosphorus, bacteria and soil. These pollutants as well as metals and other man-made compounds are found in urban runoff. The Southeast Fox River Basin is rapidly urbanizing and therefore is affected greatly by urban runoff.

The existing Dairyland Greyhound Racetrack development on the project site has a high percentage of impermeable surfaces, which washes pollutants off parking lots, streets, and lawns. Storm sewers and roadside ditches carry these untreated pollutants through storm sewers that already exist onsite to rivers and lakes. Sediment runoff contains soil and nutrients, metal from cars, trucks and rooftops, particles from vehicle exhaust, oil and grease, and pieces of pavement and vehicle tires. Transportation of these materials by runoff is a major concern in urban areas.

Residential land cover and soil types throughout the Des Plaines Watershed further inhibit water infiltration into the ground and cause precipitation to flow overland, creating drastic fluctuations in stream flow. Impermeable surfaces in residential areas such as driveways, sidewalks, and roofs, increase the potential to create large quantities of runoff containing contaminants during

and following precipitation events. Contaminants associated with residential land cover include synthetic and volatile organics and inorganics, as well as disinfectant by-products and microbial contaminants.

Groundwater Quality

Groundwater is not utilized for water supply at the Dairyland Greyhound Park. Giles Engineering Associates, Inc. (GEA) conducted a Geo-Environmental Property Survey and Preliminary Hazardous Material Presence Study in 1990 for the Dairyland Greyhound Property [Appendix G of the Phase I Environmental Site Assessment (**Appendix I**)]. Work associated with the 1990 investigation included the excavation of seven test pits, five test borings, and the installation of five groundwater monitoring wells. The report documented soil and groundwater analyses for volatile organic compounds, semi-volatile organic compounds, pesticides, and eight metals (Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Silver, and Selenium). Arsenic was found in one groundwater sample at 3 parts per billion (ppb), a concentration below any state or Federal action level. Barium was also detected in all the groundwater samples collected; however, the levels detected represent background levels that are common in the area. All other constituents tested for were below the laboratory detection limits and are therefore considered not detectable, and no further investigations were warranted.

Water Supply Quality

The Kenosha Water Utility (KWU) currently provides water service to the Dairyland Greyhound Park. The City of Kenosha utilizes surface water supplies for public water uses. The City's raw water supply is obtained completely from Lake Michigan through two intakes: a 42-inch pipe and a 48-inch pipe extending 4,700 feet from the shoreline to a depth of 30 feet (City of Kenosha, 2004). The raw water enters a 50-foot-deep low-lift pump well where the water is subsequently pumped to the 21.7 million gallons per day (MGD) Microfiltration Plant and the 20 MGD Rapid Sand Filtration Plant located at the KWU. The KWU service area is approximately 100 square miles. The City water distributing system has three pressure zones and three storage reservoirs with a combined capacity of 15 million gallons.

The 1996 amendments to the Safe Drinking Water Act require that states complete source water assessments for all public drinking water systems. Contaminants that may be present in untreated water include microbial contaminants, inorganic contaminants, pesticides and herbicides, radioactive contaminants, and organic chemical contaminants. Microbial Contaminant Levels (MCLs) are the highest level of a contaminant that is allowed in drinking water and are set at very stringent levels for treated water. With the completion of upgrades to the rapid sand filter plant and the new microfiltration facilities, none of the MCLs found in treated water samples from KWU exceeded the standards set by the USEPA (City of Kenosha, 2004). In addition, all of the turbidity tests were well below 0.3 NTU, which is the water turbidity standard set by the USEPA.

The KWU also provides wastewater service to the Dairyland Greyhound Park. Wastewater is currently treated at the Kenosha Waste Water Treatment Plant (the Plant). The wastewater is treated via oxidation ditches to limit biological oxygen demand (BOD), suspended solids, and phosphorous levels before discharging effluents to Lake Michigan. **Table 3.3-3** shows state effluent limitations and effluent rates for the Plant from November 2004. All materials found in effluents during the month of November were below state regulations and yearly averages are consistently below set limits (Gloss, pers. comm., 2005).

TABLE 3.3-3
KENOSHA WASTEWATER TREATMENT PLANT EFFLUENT QUALITY

	USEPA Limitations	November 2004 Data
BOD	30 mg/L	17 mg/L
Suspended Solids	30 mg/L	16 mg/L
Phosphorous	1 ppm	0.8 ppm

NOTE: Abbreviations: BOD = biological oxygen demand
mg/L = milligrams per liter
ppm = parts per million
USEPA = United States Environmental Protection Agency
SOURCE: Gloss, pers comm., 2005

The KWU is a municipally owned, fiscal independent public utility organized under authority of 66.068 of the Wisconsin State Statutes and Chapter XXXII of the City of Kenosha Ordinances. It is solely financed by water and sewer service charges. Wastewater regulations in the Kenosha City Code of Ordinances, Chapter 32.08, set forth uniform requirements for discharging into KWU sewers and enable the Water Utility to comply with the Clean Water Act, as amended, 33 U.S.C. 1251, et seq. and the Pretreatment Regulations, 40 CFR Part 403.

KESHENA SITE

Surface Water Quality

The Menominee Tribe regulates all activities that affect water quality, water quantity, and uses of waters on the Menominee Reservation. The Menominee Tribal Legislature enforces water quality standards for the Keshena site under Ordinance 04-22, Surface Water Regulations. As stated in Chapter 2.01, "the Ordinance applies to all surface waters and wetlands located within the exterior boundaries of the Menominee Reservation and to all facilities, practices and activities that may affect the quality and flow requirements desirable to achieve the water quality goals stated in the Ordinance for waters of the Reservation" (Menominee Tribe, 2002). The Menominee Tribal Water Quality Standards are intended to fulfill the minimum requirements of the Clean Water Act (33 USC 1342) and its implementing regulations, as amended (Ordinance 04-22, Chapter 4.01(C)).

Designated uses described in the ordinance are "protected and water quality and quantity shall be maintained at present and/or natural conditions, in order to protect and maintain designated, existing, and other beneficial uses of Tribal waters" (Ordinance 04-22, Chapter 6.01). The Ordinance identifies the following designated uses for protected waters:

- **Fish, Wildlife and Aquatic Life Use** – All waters of the Reservation are designated to provide for the protection and propagation of balanced ecosystems for indigenous fish, wildlife and aquatic life, and the protection of human health from disease related to consumption of fish, wildlife, and aquatic life, as well as the protection of these organisms from disease. The following ecosystems and their associated uses shall be protected:
  - *Cold water ecosystems*: These ecosystems include surface waters capable of supporting a community of cold water fish and other aquatic life, or serving as a spawning area and/or over wintering area for cold water fish species.
  - *Warm water ecosystems*: These ecosystems include surface waters capable of supporting a community of warm water sport fish or that serve as spawning areas for warm water sport fish.
  - *Wetlands*: These ecosystems include areas that are defined as such, and may include wild rice beds.
- **Recreation Use** – All waters of the Reservation are designated for full-body recreational use, which necessitates primary contact with the water including underwater swimming and incidental ingestion of water through participation in the recreational activity. Recreational uses also include white water rafting, canoeing, fishing, and wading, and other uses.
- **Ceremonial, Religious and Spiritual Use** – All waters of the Reservation are used for ceremonial and spiritual purposes by Tribal members (and descendants). The Tribe holds water sacred, and the historic past epitomizes this statement. The original five clans of the Menominee depended on water to sustain life and used water to perform their ceremonial responsibilities. Additional historic and modern ceremonial uses of water include, but are not limited to, uses in the annual Sturgeon Ceremony, Wild Rice harvest, and the harvesting of medicinal plants from waters of the Reservation. These uses may involve, among other things, primary direct contact, drinking and inhalation of water.
- **Cultural Use** – All waters of the Reservation, and aquatic natural resources, are designated for historic, traditional, and cultural uses. Cultural water uses encompass all ethnohydrological uses of water associated with unique Menominee ways of life. These uses include, but are not limited to: the ethnobotanical harvest and medicinal use of numerous plants associated with aquatic, wetland, and riparian habitats, as well as basic socio-economic uses of waters of the Reservation for sustenance. Waters of the Reservation shall be maintained and protected in such an ecological condition that will allow (traditional) Menominee educational uses associated with waters of the Reservation to continue perpetually.

- **Fish and Wildlife Habitat and Natural Food Chain Maintenance Use** – All waters, and aquatic and riparian ecosystems, of the Reservation are designated for wildlife habitat and natural food chain maintenance. Naturally occurring food chains/webs shall be maintained including, but not limited to, predator-prey relationships, browsing and grazing strategies, and symbiotic relationships related to food acquisition. Waters of the Reservation shall also be protected in order to provide continued ecological support for a number of rare, threatened, endangered, and culturally significant species.
- **Navigation Use** – All navigable waters of the Reservation are designated for navigational uses for Tribal purposes.
- **Forestry Use** – All waters of the Reservation are designated to support a healthy forest ecosystem, and to provide adequate water conditions for propagation of native tree species that subject to Menominee sustained yield forestry management; and, for other agricultural purposes that befit the Tribe.
- **Public Drinking Water Supply Use** – All waters of the Reservation shall be protected for use as municipal public drinking water supplies
- **Industrial Water Supply Use** – All waters of the Reservation shall be available for regulated industrial use(s), except those waters that are designated Outstanding National Resource Waters.

Criteria listed in **Table 3.3-4** are used as standards to protect waters designated for the above beneficial uses.

TABLE 3.3-4
WATER QUALITY STANDARDS FOR THE MENOMINEE RESERVATION

	Water Quality Standard
Narrative Criteria	
Settleable Material	Substances that will cause objectionable deposits on the shore or in the bed of a body of water, shall not be present in amount found to be of public health significance or nuisance, nor in amounts which are harmful to animal, plant or aquatic life.
Floating Material	Floating or submerged debris, oil, scum or other material shall not be present in such amounts found to be of public health significance or nuisance, nor in amounts which are harmful to animal, plant or aquatic life.
Color and Odor	Substances and materials producing color, odor, taste, turbidity or unsightliness shall not be present in amounts found to be of public health significance or nuisance, nor in amounts, which are harmful to animal, plant or aquatic life.
Toxic Material	All waters shall at all places, and at all times be free from hazardous substances, toxic, corrosive, or other deleterious substances, chemicals, and materials, which alone or in combination with other substances or in combination with other components of discharges, or their breakdown products, are acutely or chronically toxic, carcinogenic, teratogenic, and injure, or bioaccumulate, biomagnify, bioconcentrate, or produce adverse physiological responses in human beings and/or fish and aquatic life, or which interfere directly or indirectly with designated, existing, or other uses.

Fish, Wildlife, and Aquatic Life Criteria	
Dissolved Oxygen	The dissolved oxygen content in rivers, streams, and creeks of the Reservation shall not be lowered to less than 7 mg/l at any time, or lowered to less than 5 mg/l for lakes. The daily minimum effluent dissolved oxygen level shall be 4.0 mg/l
Temperature	There shall be no temperature changes that may adversely affect fish and aquatic life; natural daily and seasonal temperature fluctuations shall be maintained.
pH	The pH shall not be altered more than 0.5 units outside of the natural conditions. Natural daily and seasonal pH fluctuations shall be maintained. The effluent pH should be within the range of 6.0-9.0.
Toxic Substances	Discharges of substances are not permitted that alone or in combination with other materials present are toxic to fish and other aquatic life, including wild rice, wildlife, trout, lake sturgeon, and other species.
Effluents	Facilities that treat domestic wastewater, shall meet as a minimum the effluent limits specified for receiving waters consisting of cold water communities, warm water sport fish communities, and warm water forage fish communities: ▪ Effluent limits for Biochemical Oxygen Demand may not exceed 30 mg/l for the 30-day average and 45mg/l for the 7-day average. The 30-day average percent removal may not be less than 85 percent. ▪ Effluent limits for Suspended Solids may not exceed 30 mg/l for the 30-day average and 45mg/l for the 7-day average. The 30-day average percent removal may not be less than 85 percent. ▪ The effluent pH shall be within the range of 6.0-9.0. ▪ More stringent effluent limitations than those specified may be imposed for any pollutant where necessary to meet water quality standards for water receiving the treated discharge.
Recreational Use Criteria	
Fecal Coliform	Recreational water fecal coliform density from the last five successive sets of samples collected on five different days within a 30-day period shall not exceed a geometric mean of 300 per 100 ml nor shall the fecal coliform density of any sample exceed 1,000 per 100 ml. When it is determined that recreational water must be closed, daily samples shall be collected and analyzed during the period of closure. The recreational water may be reopened if the fecal coliform density in two consecutive daily samples is less than 200 per 100 ml. If contamination is indicated, water samples should be analyzed for fecal streptococcus and staphylococcus to aid in identifying the source of contamination. If there is evidence of complaints of eye, ear, nose, throat, or skin irritation, the water should be analyzed for otitis externa. The Menominee Tribe/Indian Health Service sanitary survey should also be considered.
E. coli	EPA has suggested that E. coli or enterococci organisms shall be used in addition to fecal coliform as indicators the water quality fully supports recreational uses. A geometric mean of five samples should not exceed 126 E. coli organisms per 100 ml or 33 enterococci organisms per 100 ml. A single sample should not exceed 235 E. coli or 61 enterococci organisms per 100 ml. If contamination is indicated, water samples should be analyzed for fecal streptococcus and staphylococcus to aid in identifying the source of contamination. If there is evidence of complaints of eye, ear, nose, throat, or skin irritation, the water should be analyzed for otitis externa. The Menominee Tribe/Indian Health Service sanitary survey should also be considered.

Cultural Use and Ceremonial Religions, and Spiritual Use Criteria	
Water Quality	Certain cultural, ceremonial, religious, and spiritual uses involve primary direct contact with water; therefore National Primary Drinking Water Standards shall apply. Additionally, waters of the Reservation shall be protected for Public Drinking Water Supply Use.
Fish and Wildlife Habitat and natural Food Chain Maintenance Criteria	
Biological Integrity	Substances capable of changing the chemical, physical, or biological integrity of the waters of the Reservation sufficient to cause any of the following are prohibited: ▪ Restrictions on fish and wildlife consumption; ▪ Tainting of fish and wildlife flavor; ▪ Degradation of fish and wildlife populations; ▪ Fish tumors or other deformities; ▪ Bird or animal deformities or reproduction problems, and bioaccumulation in these animals; ▪ Degradation of benthos; ▪ Restrictions on dredging activities, and contributions to the need for the same; ▪ Eutrophication or undesirable algae; ▪ Restrictions on drinking water consumption, or taste and odor problems; ▪ Beach closings, or other recreational impairments; ▪ Degradation of aesthetics; ▪ Added costs to agriculture, forestry, or industry; ▪ Degradation of phytoplankton and zooplankton populations; ▪ Loss of fish and wildlife habitat.

SOURCE: Menominee Tribe, 2002

Section 303(d) of the Clean Water Act additionally requires states to periodically prepare a list of all surface waters in the state for which designated uses of the water are impaired by pollutants. These are estuaries, lakes, streams, and groundwater basins that fall short of state surface water quality standards, and are not expected to improve within the next two years. States are also required to establish a priority ranking of these impaired waters for purposes of developing plans that include Total Maximum Daily Loads (TMDLs). These plans describe how an impaired water body will meet water quality standards through the use of TMDLs. A TMDL is a calculation of the maximum amount of a pollutant that a water body can receive and still meet water quality standards, and an allocation of that amount to the pollutant's sources. The Wolf River from Shawano Dam to Lake Poygan has been identified as impaired for fish consumption advisories most likely due to atmospheric deposition of mercury. Based on this 303(d) list priority schedule, the Wolf River has been assessed a low priority in establishing TMDLs (WDNR, 2002). States and USEPA are discussing a national strategy to reduce atmospheric deposition of mercury as an alternative to TMDLs.

Water quality of the Wolf River is largely unaffected by human activities along the entire reach of the Menominee Indian Reservation as represented by water samples collected near Langlade and Keshena (USGS, 2001). However, future land-use related activities on the Menominee

Reservation may influence the water quality of the Wolf River within the Reservation. Examples of environmental factors and land-use activities that could affect water quality in the Wolf River include geology and soils, atmospheric deposition of contaminants, agricultural activities, including fertilizer and pesticide applications and water withdrawals for irrigation, forestry, recreation, impoundments, road construction, wetland drainage, urban development, wastewater treatments, and potential development of a large-scale copper/zinc mine in the headwaters of the Wolf River.

From 1986 to 1998, the USGS collected water quality samples from stations on the Wolf River near Langlade, at Keshena, and at Shawano and analyzed them for field-measured characteristics, major ions, nutrients, trace elements, and pesticides. Water in the Wolf River on the Menominee Reservation is of a calcium-magnesium bicarbonate type. Concentrations of other commonly found major ions such as sodium, potassium, chloride, fluoride, and sulfate are present only at low concentrations. Total solids (residue) concentrations in the Wolf River were low at the three sampled sites, with mean concentrations ranging from 7 to 9 milligrams per liter (mg/L) (USGS, 2001). In general, no significant differences in water quality were found in data collected upstream at Keshena and Shawano during water years 1986 through 1998.

Concentrations of nutrients and the various species of nitrogen and phosphorus were low in samples collected at the three Wolf River sites (USGS, 2001). Absence of excessive levels of nutrients indicates that the Wolf River is not substantially affected by sewage or septic-system discharges, runoff or groundwater that is contaminated with agricultural fertilizer or animal manure wastes, nutrient-laden industrial discharges, or any other substantial sources. Concentrations of phosphorus and nitrogen in water samples from the Wolf River at the three sites were also low, indicating an absence of pollution in the river. A wide variety of trace elements are present in the Wolf River that originate from geologic materials and natural weathering in the basin. Most concentrations generally do not exceed USEPA water-quality standards for public water supplies; however, the surface water contained elevated levels of iron and manganese. Although elevated concentrations of iron and manganese may result in objectionable taste and staining of laundry and plumbing fixtures, they do not pose any health risks. According to the USGS water quality report (2001), the overall biological integrity of surface water at the Keshena and Langlade sites is excellent, based on diversity, siltation, and pollution indexes for diatoms.

Groundwater Quality

Having jurisdiction by law under 40 CFR 1508.15, the Menominee Tribe regulates all activities that affect groundwater quality, quantity, and uses of groundwater on the Menominee Reservation. The Menominee Tribal Legislature enforces groundwater quality standards for the Keshena site under Ordinance 87-28, Groundwater Quality Regulations. As stated in Chapter MTGW 2, "[The Ordinance] applies to all facilities, practices and activities which may affect groundwater quality" (Menominee Tribe, 1988). The Menominee Tribal Water Quality

Standards are intended to "establish groundwater quality standards for substances detected in or having a reasonable probability of entering the groundwater resources of the Menominee Reservation" (Ordinance 87-28, Chapter MTGW 1).

Water quality in the Wolf River is determined by water entering the Reservation from areas upstream, surface runoff on the Reservation, and also by groundwater discharging to the river from the unconfined bedrock and overlying sand and gravel aquifers. This contributing groundwater is of a calcium-magnesium, bicarbonate type with low concentrations of dissolved solids, sulfate, and chloride (USGS, 1994).

A hydrologic study was conducted on the Menominee Indian Reservation by the USGS, in cooperation with the Tribe. Water samples for chemical analysis were collected from wells in the sand and gravel and bedrock aquifers to characterize the ambient quality of groundwater on the Reservation (USGS, 1994). Since the principal use of ground water on the Menominee Reservation is for domestic supply, water samples were also analyzed for constituents for which maximum permissible concentrations are specified by USEPA maximum contaminant levels (MCLs) and secondary maximum contaminant levels (SMCLs). Results of the reconnaissance indicated that no widespread problem exists with respect to high concentrations of health-related inorganic constituents in groundwater on the Reservation.

In addition, a Ground Water Supply Susceptibility Determination was completed by a committee consisting of personnel from Tribal Utility, Community Development, Indian Health Service (IHS), and Environmental Services (Menominee Tribe, 2004). Data from existing well logs, groundwater modeling, USGS topographical maps, aerial photos, and onsite visits was used to complete the determination. Well chemistry of the Keshena water system was determined to be good, and no potential major sources of contamination were found within either the 10 or 50 year area of contribution (Menominee Tribe, 2004). The susceptibility to potential contamination for the Keshena Public Water System was determined to be low to moderate.

Water Supply Quality

Water used for domestic purposes on the Reservation is obtained from underlying aquifers. The Menominee Tribal Utility Department (MTUD) currently provides water for the Menominee Casino. MTUD operates two groundwater wells in downtown Keshena, which serve as the water supply for the existing casino-hotel facilities. The groundwater wells contain a filtration system for iron removal and add chlorine and fluoride for bacterial treatment, in accordance with USEPA and Health Service standards. Once iron is removed and the water treated, well water is pumped to a water tower for distribution to the Menominee Casino.

The Tribe is currently working with USEPA to conduct a source water assessment to identify the area around groundwater wells that need to be protected from contamination. The assessment will include identification of potential sources of contamination and determining the

susceptibility of the wells to contamination. MTUD applied for and received a tribal grant from USEPA for the exploration and potential replacement of the two community wells now located in the 100-year floodplain. Both water towers were cleaned and inspected.

The USEPA requires the Tribe to monitor for certain contaminants less than once per year since the concentrations of these contaminants do not change frequently. **Table 3.3-5** provides a list of all the drinking water contaminants that were detected from various years of data reporting. David Corn, the Utilities Manager at MTUD, has indicated that no violations of any contaminant have been reported from 1995 to the present.

TABLE 3.3-5
DRINKING WATER QUALITY DATA

Contaminants	MCLG	MCL	Sample Data	Date	Violation	Typical Source
Aresenic (ppb)	n/a	50	2.5	1995	**No**	Erosion of natural deposits; runoff from orchards; runoff from glass and electronics production wastes
Nitrates (ppm)[1]	10	10	<0.14	1999	**No**	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits.
Alpha Emitters (pCi/L)[2]	0	15	3.9 ± 2.3	1999	**No**	Erosion of natural deposits
Copper (ppm)	1.3	0.062	0	1998	**No**	Erosion of natural deposits; leaching; corrosion of household plumbing systems; from wood preservatives
Lead (ppb)	15	5	0	1998	**No**	Corrosion of household plumbing systems; erosion of natural deposits.

NOTE: [1]Nitrates are measured as nitrogen content
[2]Alpha emitters measure radioactive contaminants
Abbreviations: MCLG = maximum contaminant level goal; MCL = maximum contaminant level; ppm = parts per million; ppb = parts per billion
SOURCE: Menominee Tribal Utilities Department, 2004

MTUD also provides wastewater service and treatment to the Menominee Casino. Wastewater is transported from the Menominee Casino through a network of sewage pipes to a mechanical wastewater treatment plant for treatment via an oxidation ditch. An oxidation ditch is a modified activated sludge biological treatment process that utilizes long solids retention times to remove biodegradable organics (USEPA, 2000). Before the mechanical plant was constructed, a facultative lagoon treatment was used for wastewater management. The facultative lagoon is used presently as an emergency treatment method when the oxidation ditch is not in service. The

MTUD facilities manager has indicated that BOD, total suspended solids, and phosphorus levels are all within USEPA limits (David Corn, pers. comm., 2005).